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ABSTRACT

Recently there has been legislation aimed at aligning education and industry interests to better meet the needs of students, workers, and employers. After the passage of the Perkins Vocational and Applied Technology Act in 1990 and its reauthorization in 1992, the U.S. Departments of Labor and Education jointly initiated funding for 22 projects to develop industry skill standards in diverse industries. The National Skill Standards and Assessment Collaborative (NSSAC) has combined some of the efforts of the 22 projects to develop cross-industry standards linked to the industry skill standards for 4 partner industries, and they have pilot tested assessment methods that apply across these industries. This paper reports on the cross-industry analysis and subsequent assessment development work with one assessment method. First, the paper discusses the individual industry standards and their structure, highlighted by an example. Following discussion of the individual standard sets, the paper discusses the methodology and findings from the cross-industry analysis. To highlight the use of cross-industry standards for the purposes of assessment development, preliminary efforts in one area, written scenarios, are discussed. The four industries are: (1) retail and professional sales; (2) community support service worker; (3) health care services; and (4) electronics. The Secretary's Commission on Achieving Necessary Skills (SCANS) skills and competencies were used as an external referent to help establish a basis for the analysis. While portfolios and scenarios were chosen as two performance-based assessment methods on which to focus assessment development efforts, this paper concentrates on scenarios. The written scenario involves presenting a work-related situation for which the respondent is asked to develop and present a solution. Developing scenarios for the four industries is discussed. (Contains 8 tables, 4 figures, and 14 references.) (SLD)

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Using Skill Standards to Generate Cross-Industry Areas for Certification and Assessment

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April 1998

Paper presented at the annual meeting of the American Educational Research Association at San Diego, CA

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Introduction

For many years, both in education and industry, professionals have relied on standards to help determine what students or workers should know and be able to do. Still, the visibility of the standards movement in America has increased significantly in the last fifteen years, largely because of concerns about the effectiveness of schools (Nation at Risk, 1983) and the competitiveness of American industries in the global marketplace (America's Choice: High Skills or Low Wages, 1990). These concerns have led people in both arenas to try to identify and define new ways to increase the quality of performance.

Recently, a wave of legislation has been enacted aimed at aligning education and industry interests to better meet the needs of students, workers, and employers. The Carl D. Perkins Vocational and Applied Technology Education Act (Perkins II) in 1990 was pivotal in initiating the process of broad-based consensus building between education and industry. This law required vocational education programs to develop and implement a system of performance standards, assessment measures, and services that provide "strong experience in and understanding of all aspects of the industry students are preparing to enter...." (Perkins II).

Following Perkins II in 1992, the U. S. Departments of Education and Labor jointly initiated funding for 22 projects to develop industry skill standards in diverse industries. Three interlocking pieces of legislation in subsequent years further strengthened the call for integrated education and industry standards: the School-to-Work Opportunities Act (STWOA), Goals 2000: Educate America Act, Improving America's Schools Act, and National Skill Standards Act, which establishes the National Skill Standards Board (NSSB). Taken together, these legislative mandates promote the development of voluntary systems of national academic and industry skill standards and assessments. Presently, the NSSB is funding "voluntary partnerships" with broad member representation to endorse skill standards in different economic sectors.

The National Skill Standards and Assessment Collaborative (NSSAC)

The National Skill Standards and Assessment Collaborative (NSSAC) combined the efforts of four of the original 22 national skill standards pilot projects to address issues concerning assessment and certification. With WestEd as the lead partner, NSSAC included four diverse industries — health care (represented by WestEd), electronics (American Electronics Association, AEA), human services (Human Services Research Institute, HSRI), and retail (National Retail Federation, NRF). With support from the U. S. Department of Labor (DOL) and the National Skill Standards Board (NSSB), NSSAC has (1) developed cross-industry standard areas or categories that are linked to the industry skill standards developed for the four partner industries, and (2) pilot-tested assessment methods that apply across these industries, based on these standards (see WestEd, 1998 for a complete discussion of this project and the assessment development and piloting).

A central expectation of the skill standards "community" is that they will be able to identify the common foundation of knowledge and skills needed across the majority of occupations within the economy (Hoppe & Wills, 1996). A major focus of the NSSAC project was to identify common

standard areas across the four participating industries that could be used as a basis for assessment development. These standards are assumed to be essential for industry, applicable to secondary and post-secondary education, and linked to a high level of challenge and expectation.

To proceed in identification of common standards, WestEd staff first examined each individual industry's skill standards; then we looked for commonalities or general skills described across all sets of standards.

Because of differences across the targeted sets of standards in the level of generality vs. detail and industry-specific language, we used the Secretary's Commission on Achieving Necessary Skills (SCANS, 1992) skills and competencies as an external referent to help establish a basis for analysis. SCANS identifies general competencies and a foundation of basic skills, thinking skills, and personal qualities necessary for employment. The SCANS report describes five competencies (Resources, Interpersonal, Information, Systems, and Technology) and a three-part foundation of skills and personal qualities (Basic Skills, Thinking Skills, and Personal Qualities). These eight components are further divided into sub-skills which are integrated in various ways for performance of workplace tasks. SCANS represents a workplace foundation and provides a good reference point for pinpointing overlap or commonalties.

This paper, which draws on the *Cross-Industry Assessment and Certification: Framework and Implementation Guide* (WestEd, 1998), reports on the cross-industry analysis and subsequent assessment development work with one assessment method. First, the paper discusses the individual industry standards and their structure, highlighted by an example. Following discussion of individual standard sets, the paper discusses the methodology and findings from our cross-industry analysis. To highlight the use of cross-industry standards for the purposes of assessment development, preliminary efforts in one area, written scenarios, are discussed.

National Retail Federation -- Retail and Professional Sales

The National Retail Federation (NRF) Skill Standards focus on one occupational area, *Professional Sales Associate*. The retail industry employs a large proportion of the entry-level workforce. Retail workers are often younger and less likely to have college degrees than workers in other industries. Traditionally, retail work tends to involve part-time jobs (Bailey & Bernhardt, 1996) but provides opportunities to learn the types of customer service and sales skills that are useful in many industries. *Professional Sales Associates* represents the majority of entry-level jobs.

The skill standards are accompanied by an implementation guide and suggested performance indicators for assessment. The indicators are intended to be tailored for different work situations. The implementation guide includes some suggested assessment techniques.

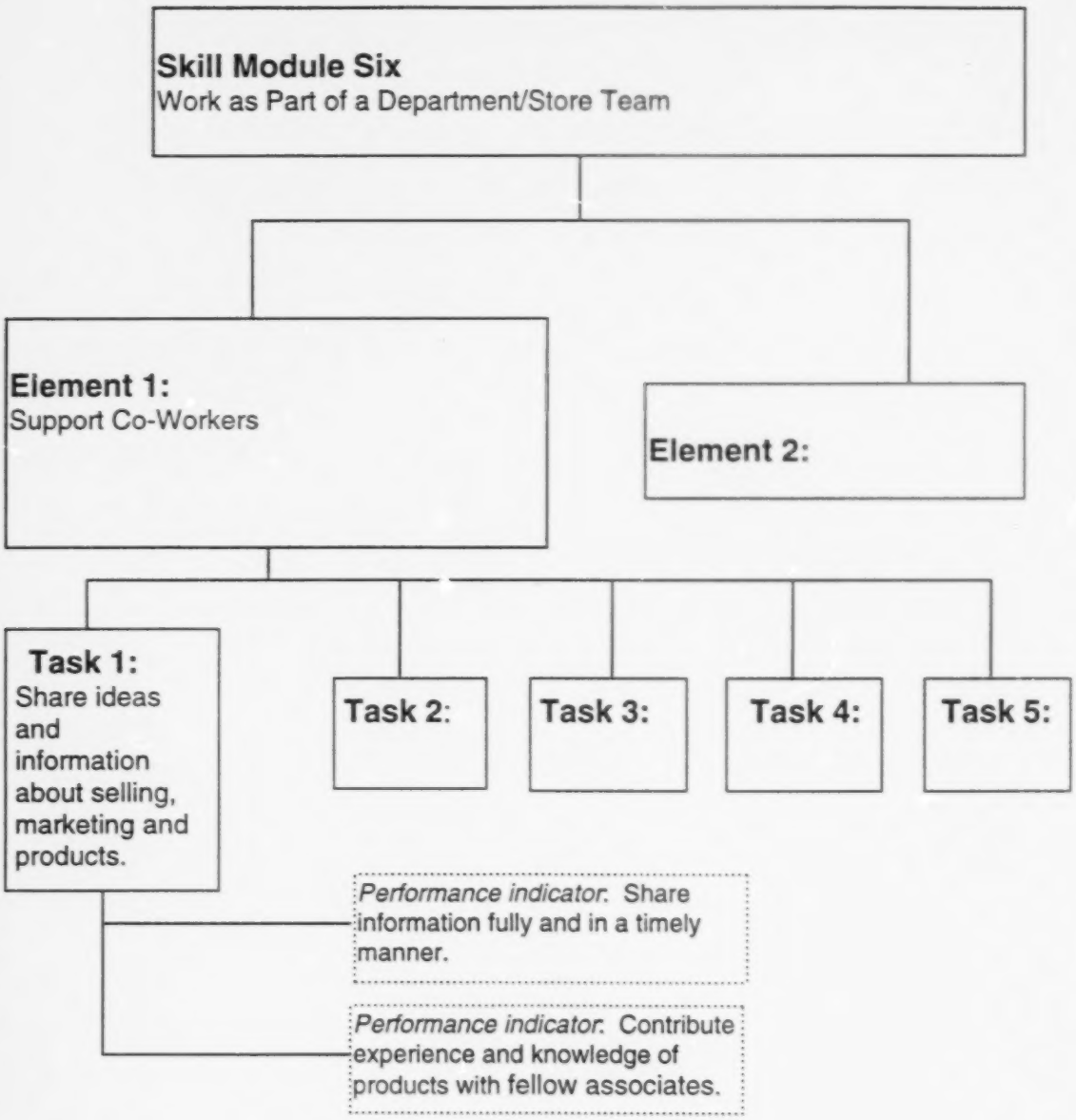
The NRF used a DACUM (Developing a Curriculum) procedure to develop the skill standards. A DACUM procedure is one type of systematic occupational analysis that allows for identification of job tasks. Groups of retail sales associates and managers participated in this process. National groups, including high-performance workplaces, validated the tasks and skills, ranked their importance, and identified performance indicators.

Structure of the Standards

The NRF Skill Standards consist of six skill modules (*Provide Personalized Customer Service, Sell and Promote Products, Monitor Inventory, Maintain Appearance of Department/Store, Protect Company Assets, and Work as Part of a Department/Store Team*). The modules offer a flexible framework for standards use, as some modules may be more relevant to some sales situations than others. From two to three elements or key features comprise each skill module. From three to 11 key tasks or skills comprise each element. The key tasks include performance indicators or explicit examples of behaviors involved in successfully performing the task.

For example, *Work as Part of a Department/Store Team* is a skill module containing two elements, *Support Co-Workers* and *Create Competitive Advantage*. As shown in Figure 1, one element, *Support Co-Workers,* is comprised of five key tasks. Competent performance of the first key task (*Share ideas and information about selling, marketing, and products*) might be documented through two suggested performance indicators: *Share information fully and in a timely manner* and *Contribute experience and knowledge of products with fellow associates.*

Figure 1.
Structure of National Retail Federation Skill Standards


Skill Module Six
Work as Part of a Department/Store Team
Element 1:
Support Co-Workers
Element 2:
Task 1:
Share ideas and information about selling, marketing and products.
Task 2:
Task 3:
Task 4:
Task 5:
Performance indicator: Share information fully and in a timely manner.
Performance indicator: Contribute experience and knowledge of products with fellow associates.

Human Services Research Institute -- Human Services

The Community Support Skill Standards also focus on a single occupational area, the *Direct Service Worker*. Institution-based service workers are excluded; the standards apply primarily for community-based service delivery contexts. Human services delivery contexts are gradually shifting from institutional and centralized environments to community-based environments. A majority of direct service workers now work in community-based organizations and the skill set needed in a community context is sufficiently different from skills needed in institutional settings that they must be treated differently. The Community Support Skill Standards reflect industry direction and a philosophical shift toward community-based services.

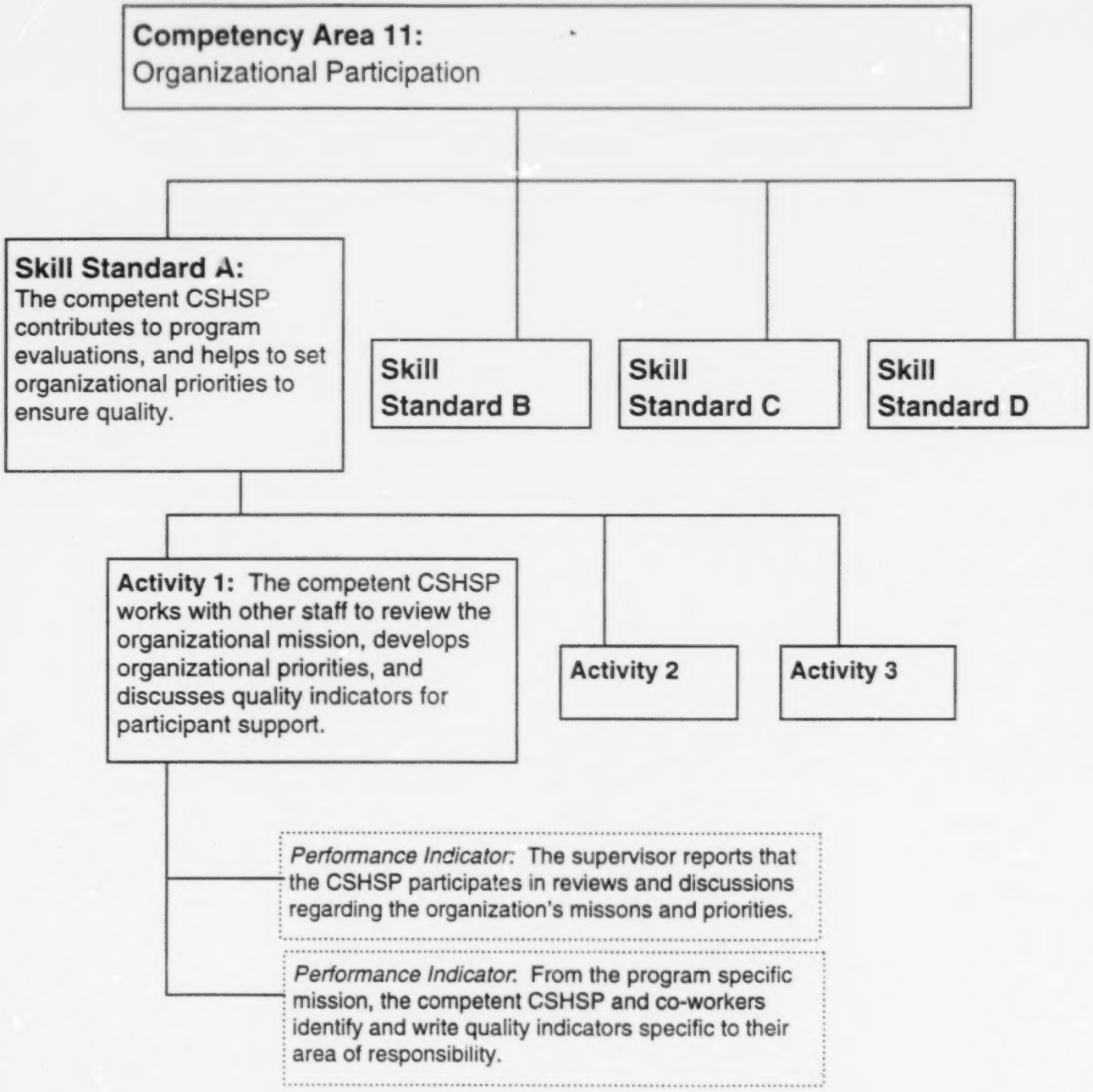
The standard-development process included a job analysis and DACUM process, as well as validation by review of stakeholders. Master workers, identified by level of experience and supervisor recommendation, among other factors, participated in a series of workshops to define the major competencies, activities, knowledge and skills involved in their jobs. Results of the workshops were validated by a national survey. A Standards Development Team wrote the standards document based on the job analysis. Stakeholder groups, including clients, families, providers, workers, teachers, trainers, and technical committee reviewed draft documents and made recommendations for revisions.

Structure of the Standards

The Community Support Skill Standards are organized into twelve standard units. Each unit represents a broad, functional theme of human service work, called a competency area. Specific functions for each area are broken into two to five skill standards. Each skill standard is linked to one or more sample activities that are relevant to and representative of what human service workers actually do. Each sample activity is followed by one or more performance indicators which provide a basis for measuring performance. The performance indicators consist of observable worker behaviors, client reports, and worker self-reports.

An example of a skill standard in the HSRI competency area, *Organizational Participation*, which involves participation as a member of a team, is displayed in Figure 2.

Figure 2.
Structure of Human Services Research Institute Skill Standards


Competency Area 11:
Organizational Participation
Skill Standard A:
The competent CSHSP contributes to program evaluations, and helps to set organizational priorities to ensure quality.
Skill Standard B
Skill Standard C
Skill Standard D
Activity 1: The competent CSHSP works with other staff to review the organizational mission, develops organizational priorities, and discusses quality indicators for participant support.
Activity 2
Activity 3
Performance Indicator: The supervisor reports that the CSHSP participates in reviews and discussions regarding the organization's missons and priorities.
Performance Indicator: From the program specific mission, the competent CSHSP and co-workers identify and write quality indicators specific to their area of responsibility.

WestEd -- Health Care Services

The National Health Care Skill Standards Project (NHCSSP) standards focus on occupational clusters or sets of related occupations and functions. A regional educational research laboratory, WestEd, formerly Far West Laboratory, directed the development process, in collaboration with numerous health care industry, education, and labor organizations. Representatives of as many aspects of health care as possible participated in the development process to provide for a variety of perspectives. The health care industry is well-organized with multiple levels of existing certifications (Grubb, 1996) and the standards provide a broad base within this industry context. The standards are designed to apply primarily to entry and technical level workers.

Standards development began with review of existing task analyses of health care occupations. Broad categories of skills were identified and synthesized into task summaries. Committees formed of representatives from health, labor, and education drafted standards based on the task summaries and committee members' shared experience and expertise. Validation proceeded in a three-pronged effort, including external review by a range of participants not involved in generating the standards, survey of a targeted group of health care experts and practitioners, and focus groups of workers and supervisors at a range of delivery sites across the country. In addition, responses to a brief questionnaire at the end of the standards document were examined. Twelve industry and education sites piloted various applications of the standards.

Structure of the Standards

The NHC Skill Standards are organized into a set of eight core skills and four occupational clusters: Therapeutic, Diagnostic, Information Services, and Environmental. The eight core skills apply to the full range of health care workers; standards in each cluster apply to jobs that fall into that cluster. Two clusters, Therapeutic and Diagnostic, have a common core of five standards that apply to both sets of related occupations.

The NHC Skill Standards are content standards only; the pilot studies were intended to inform development of performance standards. Each standard includes a brief title describing the skill, a more detailed description of the knowledge and skills required for attainment of the standard, and four to seven specific examples for illustration. In addition to the eight core skill standards, there are 31 standards across the four occupational clusters.

For example, one of the common core standards is *Teamwork*. This standard appears in the *National Health Care Skill Standards* handbook as follows:

TEAMWORK

Health care workers will understand the role and responsibilities of individual members as part of the health care team, including their ability to promote the delivery of quality health care. They will interact effectively and sensitively with all members of the health care team.

The following may be included:

- Practice team membership skills, such as cooperation, leadership, and anticipation of the needs of coworkers
- Respect cultural and religious differences of team members
- Interact with others consistent with the health care team structure and lines of authority
- Manage conflict within the workplace through consideration of others' points of view
- Respect interdisciplinary differences among team members

American Electronics Association -- Electronics

The American Electronics Association (AEA) Skill Standards consists of five components, four sets of skill standards for different occupational areas and a framework for foundation skills and workplace competencies. The foundation skills and competencies are derived from SCANS. AEA supplemented the SCANS categories and tailored SCANS definitions, with changes related primarily to technological and business-specific skills and competencies.

The AEA Skill Standards represent four different occupational areas. Each occupational area consists of five to seven critical functions or "what one must be able to do to achieve the key purpose" of that area. Two to five activities define each critical function; each activity has associated performance indicators. The performance indicators offer ways of assessing whether the activity has been performed competently. Each activity has at least three and, some, as many as nine associated performance indicators. According to the AEA standards handbook, *Setting the Standard: A Handbook on Skill Standards for the High-Tech Industry*, each critical function can be thought of as a competency module. The system is designed to enhance flexibility so that demonstrating competency in a critical function in one occupational area is likely to be transferable to other occupations and fields. The standards are designed to be applied primarily to non-baccalaureate level workers.

The standard development process began with occupational analysis groups that included employees of over 100 member companies. During these sessions, participants identified the key purpose for each of the four occupational areas and collaboratively drafted the skill standards. A survey of key stakeholders validated the standards. Over 2000 workers and supervisors from a cross-section of high-tech companies, ranging from software to aerospace electronics, responded. Stakeholders rated the importance of each activity to doing their job and the importance of each performance indicator on a scale of "1" or "Of Little Importance" to "4" or "Very Important." Ninety-nine to 100% of all activities and performance indicators received an average rating of at least 2.75, or better than "Somewhat Important." No activities received the lowest rating.

Generalized AEA Occupational Area

The AEA skill standards presented an unique problem in identifying commonalities across the standard sets as four occupational areas are defined. Examination of the skill standards for the four occupational areas revealed similarities between the skill sets for three of the occupational areas and marked differences with the skill set of the fourth. The fourth skill standard set, for *Manufacturing Specialist Team Leader*, reflected line management duties and responsibilities, particularly reflective of a coach-manager role. Nearly all of the key activities listed for this occupational area (18 of 20 activities) began with "Ensure team" [illegible]elp team." Such terminology indicates a leadership rather than frontline worker role. Skill standards for the other three occupational areas included key activities at the non-managerial level.

For the purposes of analysis, we collapsed the three non-managerial occupational areas into one generalized occupational area. The critical functions for each of these occupational areas were mapped to broader functions, which we then used as the basis for comparison to SCANS. This approach allowed us to retain functions unique to the industry but produced a generalized set of functions and activities that could be compared to SCANS and the skill standards of the three other industries. As noted in the AEA standards handbook, some critical functions are very similar across electronics occupations, as well as across industries. The skill standards for *Manufacturing Specialist Team Leader*, not representing entry-level skills, was not included in the analysis. The general occupational model consisted of seven critical functions reorganized in Table 1 as follows:[1]

Table 1.
General Occupational Model Used for AEA Skill Standards Crosswalk

Critical Functions for Each Occupational Area in Relation to Generalized Model			
Generalized Occupational Area	***Manufacturing Specialist***	***Administrative/ Information Services Support***	***Pre/Post Sales***
Function One: Customer Needs	Establish customer needs	Identify customer needs and plan work activities	Identify customer and customer needs
Function Two: Communication	Initiate and sustain communication processes and procedures	Initiate and facilitate communication	
Function Three: Continuous Improvement	Ensure production process meets business requirements		Promote improved customer service and satisfaction
Function Four: Design and Develop Work Processes and Procedures	Determine design workability and manufactorability	Develop, implement, and evaluate work processes and procedures	Propose solution that satisfies customer needs
Function Five: Resource Management	Use human resources to manage work flow	Manage resources	Facilitate implementation and delivery of solution

(Continued next page)

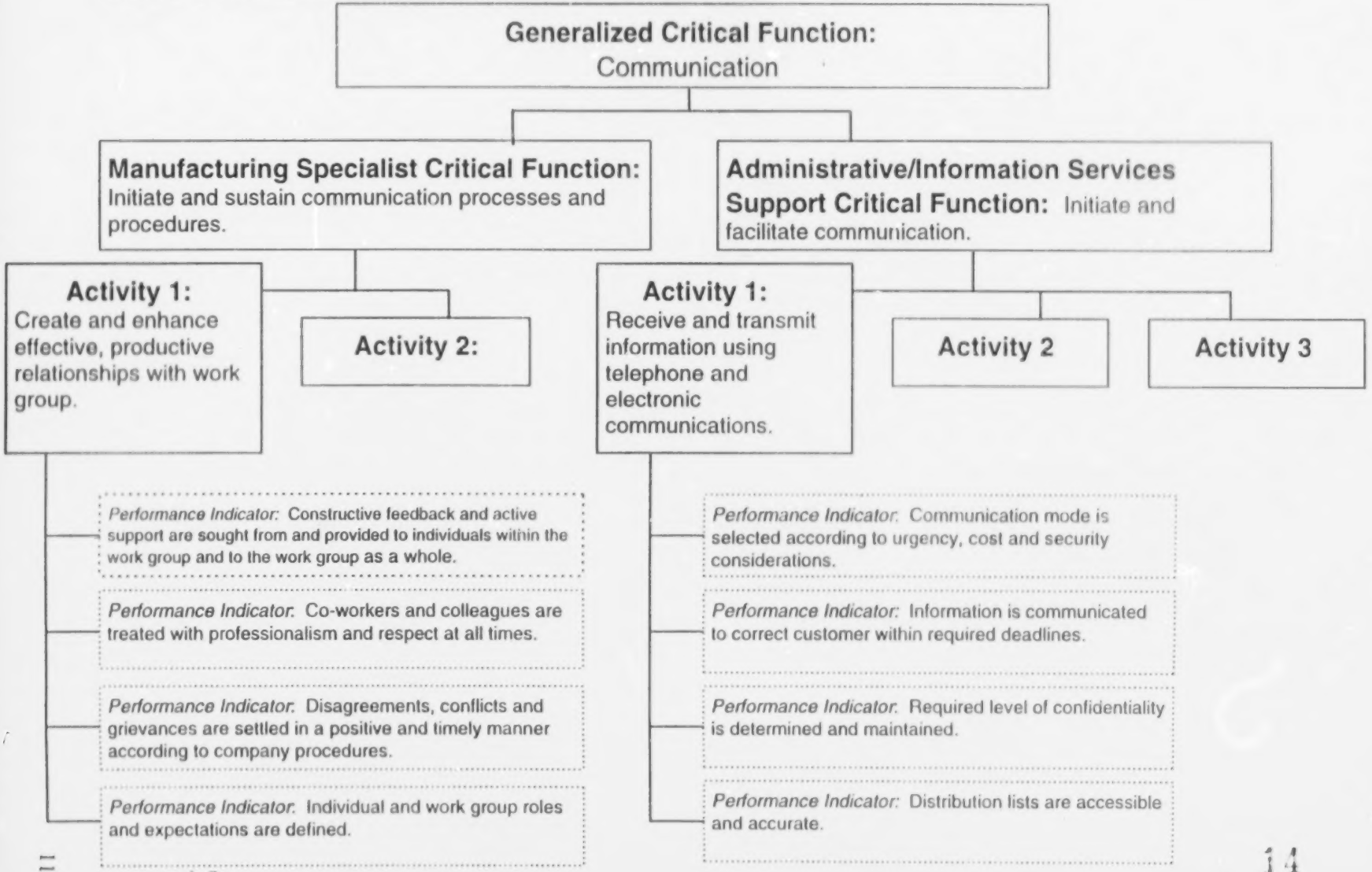
[1] Note that the different AEA occupational areas listed distinctly different performance indicators for the same critical functions. Performance indicators are at a more job-specific level than the activities listed above and reflect important differences within industry and occupational areas.

Table 1. (Continued)
General Occupational Model Used for AEA Skill Standards Crosswalk

Critical Functions for Each Occupational Area in Relation to Generalized Model			
Generalized Occupational Area	***Manufacturing Specialist***	***Administrative/ Information Services Support***	***Pre/Post Sales***
Function Six: Planning Strategies to Accomplish Work	Select, obtain, and optimize available machines and equipment to meet product process requirements	Manage schedules, activities, and events to achieve objectives	Develop options to meet customer needs
Function Seven: Information Tracking and Handling	Make products that meet customer specifications	Generate and maintain documents and information	

Figure 3, on the next page, graphically displays Function Two: *Communication* from the generalized model, similarly to our examples from the other skill standards sets.

Figure 3.
Structure of American Electronics Association Skill Standards


Generalized Critical Function:
Communication
Manufacturing Specialist Critical Function:
Initiate and sustain communication processes and procedures.
Administrative/Information Services Support Critical Function: Initiate and facilitate communication.
Activity 1:
Create and enhance effective, productive relationships with work group.
Activity 2:
Activity 1:
Receive and transmit information using telephone and electronic communications.
Activity 2
Activity 3
Performance Indicator: Constructive feedback and active support are sought from and provided to individuals within the work group and to the work group as a whole.
Performance Indicator: Co-workers and colleagues are treated with professionalism and respect at all times.
Performance Indicator: Disagreements, conflicts and grievances are settled in a positive and timely manner according to company procedures.
Performance Indicator: Individual and work group roles and expectations are defined.
Performance Indicator: Communication mode is selected according to urgency, cost and security considerations.
Performance Indicator: Information is communicated to correct customer within required deadlines.
Performance Indicator: Required level of confidentiality is determined and maintained.
Performance Indicator: Distribution lists are accessible and accurate.

Cross-Industry Analysis

Comparison of the four standard sets can be accomplished in two ways. First, commonalities among the four industry standards can be identified and a core set of cross-industry standard areas specified. Because of differences in the level of generality vs. detail and use of industry-specific language, this is a difficult task.

Alternatively, a well-defined and validated set of general workplace skill and competencies can be used as a point of reference in thinking about the different standards sets to help generate a broad set of competency areas that applies across industries. This is the approach we chose, using SCANS skills and competencies as our reference point for crosswalking the industry skill standards.

Methodology

To proceed with the analysis, we constructed a matrix and crosswalked the SCANS foundation skills and competencies and the skill standards from each of our industry partners, retail and professional sales, human services, electronics, and health care services. Initially, we assigned a code to each SCANS sub-skill or sub-competency. For example, we assigned the code F1 to the SCANS Foundation Skill, Reading. Table 2 lists SCANS foundation skills and workplace competencies and their assigned codes.

Table 2.

SCANS Foundation Skills and Competencies

SCANS Foundation Skills	SCANS Competencies
Basic Skills • Reading (F1) • Writing (F2) • Arithmetic (F3) • Mathematics (F4) • Listening (F5) • Speaking (F6) Thinking Skills • Creative Thinking (F7) • Decision Making (F8) • Problem Solving (F9) • Seeing Things in the Mind's Eye (F10) • Knowing How to Learn (F11) • Reasoning (F12) Personal Qualities • Responsibility (F13) • Self-Esteem (F14) • Sociability (F15) • Self-Management (F16) • Integrity/Honesty (F17)	Resources • Allocates Time (C1) • Allocates Money (C2) • Allocates Materials and Facility Resources (C3) • Allocates Human Resources (C4) Interpersonal • Participates as a Member of a Team (C5) • Teaches Others (C6) • Serves Clients/Customers (C7) • Exercises Leadership (C8) • Negotiates (C9) • Works with Cultural Diversity (C10) Information • Acquires and Evaluates Information (C11) • Organizes and Maintains Information (C12) • Interprets and Communicates Information (C13) • Uses Computers to Process Information (C14) Systems • Understands Systems (C15) • Monitors and Corrects Performance (C16) • Improves and Designs Systems (C17) Technology • Selects Technology (C18) • Applies Technology to Task (C19) • Maintains and Troubleshoots Technology (C20)

For each standard, the point of overlap between each SCANS component and the industry skill standard was evaluated. All of the SCANS sub-skills reflected in that standard were coded in the appropriate box of that industry's matrix. We coded one matrix for each set of industry skill standards in this manner. For example, Table 3 displays the National Health Care Skill Standards matrix as coded in relation to the SCANS sub-skills and competencies. When a sub-skill or competency was deemed necessary for accomplishing the standard, although not always explicitly stated, the coder inferred that it was necessary and applied the code. Thus, the coding represents a generous interpretation of the necessary foundation skills underlying each standard.

Table 3.

Matrix Crosswalking the National Health Care Skill Standards and SCANS Foundation Skills and Competencies

	SCANS Foundation Skills			SCANS Competencies				
National Health Care Skill Standards	**Basic Skills**	**Thinking Skills**	**Personal Qualities**	**Resources**	**Interpersonal Skills**	**Information**	**Systems**	**Technology**
Academic Foundation	F1-Reading F2-Writing F3-Arithmetic F4-Mathematics F5-Listening F6-Speaking	F11-Knowing How to Learn F12-Reasoning	F13-Responsibility			C11-Acquires & Evaluates Information C13-Interprets & Communicates Information		
Communication	F1-Reading F2-Writing F5-Listening F6-Speaking	F8-Decision Making F9-Problem solving	F15-Sociability		C10-Works with Cultural Diversity C6-Teaches Others	C11-Acquires & Evaluates Information C13-Interprets & Communicates Information	C15-Understands Systems	C19-Applies Technology to Task
Systems	F1-Reading F2-Writing F3-Arithmetic F5-Listening F6-Speaking	F12-Reasoning		C3-Allocates Material & Facility Resources	C5-Participates as a Member of a Team	C11-Acquires & Evaluates Information	C15-Understands Systems C16-Monitors & Corrects Performance C17-Improves & Designs Systems	
Employability Skills	F5-Listening	F8-Decision Making F9-Problem solving F12-Reasoning	F13-Responsibility F15-Sociability F16-Self-Management		C10-Works with Cultural Diversity	C11-Acquires & Evaluates Information C14-Uses Computers to Process Information	C15-Understands Systems	C19-Applies Technology to Task
Legal Responsibilities	F1-Reading F2-Writing F3-Arithmetic F4-Mathematics F5-Listening F6-Speaking	F8-Decision Making	F17-Integrity/Honesty		C7-Serves Clients/Customers	C11-Acquires & Evaluates Information C12-Organizes & Maintains Information	C15-Understands Systems C16-Monitors & Corrects Performance	

Table 3. (Continued)

Coded Matrix Crosswalking the National Health Care Skill Standards and SCANS Foundation Skills and Competencies (Continued)

	SCANS Foundation Skills			SCANS Competencies				
National Health Care Skill Standards	**Basic Skills**	**Thinking Skills**	**Personal Qualities**	**Resources**	**Interpersonal Skills**	**Information**	**Systems**	**Technology**
Ethics	F1-Reading F2-Writing F5-Listening F6-Speaking	F12-Reasoning F8-Decision Making F9-Problem solving	F15-Sociability F13-Responsibility F17-Integrity/Honesty	C1-Allocates Time	C7-Serves Clients/Customers C5-Participates as a Member of a Team C10-Works with Cultural Diversity C8-Leadership			
Safety Practices	F1-Reading F2-Writing F5-Listening F6-Speaking	F12-Reasoning	F13-Responsibility	C3-Allocates Material & Facility Resources		C11-Acquires & Evaluates Information		C19-Applies Technology to Task
Teamwork	F5-Listening F6-Speaking	F12-Reasoning F9-Problem solving	F15-Sociability	C1-Allocates Time	C5-Participates as a Member of a Team C10-Works with Cultural Diversity C9-Negotiates C8-Leadership		C15-Understands Systems	

Two coders independently coded one set of skill standards, the health care industry standards. Intercoder reliability was computed[2] (reliability = 66% interrater agreement). Discussions between coders revealed differences related to interpretation of SCANS thinking skills, problem solving, and decision making. One rater tended to consider behaviors involving the use of logic and application of rules as problem solving while the other rater coded such behaviors as decision making. A second interrater difference related to the hierarchical nature of some SCANS competencies, with one rater listing all competencies in a component, while the other listed only the highest level competency, resulting in fewer overall matches. All other sets of industry skill standards were similarly coded by a single rater. In the case of the electronics industry, we used the synthesized general occupational standards.

To create our cross-industry categories, we first summed the occurrence of each individual code over the standards for each industry. In this way, we were able to describe the most common sub-skills reflected in a set of standards, as well as any clusters of sub-skills and competencies that repeated across the standards for that industry.

Results

In terms of the SCANS competencies the following can be noted across the four sets of industry standards (see Table 4 for results for each industry standard set):

- Information competencies are common and the most prevalent SCANS competencies across all sets of standards.

- Interpersonal competency areas are common and, in the retail, human services, and health care industry standards, as prevalent as Information competencies. In the electronics industry, Resources competencies were more prevalent than Interpersonal.

- Understanding and working effectively within systems is a common SCANS competency. Systems, itself, was identified in the health care skill standards as a separate standard area.

- Apply Technology to Task or using technology (sometimes coded with Using Computers to Process Information) is a competency common across all four industries in SCANS technology area.

Findings regarding the SCANS foundation skills follow.

- Decision making, problem solving, and reasoning are SCANS thinking skills which are necessary across industries and often are embedded in the same standard.

- Responsibility and, to a lesser extent, sociability are SCANS personal qualities common across these industries.

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[2] Intercoder agreement was computed using the following formula: reliability = number of agreements/total number of agreements + disagreements. According to Miles and Huberman (1994), 70% intercoder agreement for initial use of conceptual coding systems is recommended. However, interrater reliabilitiy can be expected to improve with discussion of interrater differences and recoding.

- Mathematics is related to fewer standards than the other SCANS foundation skills, but is necessary for meeting the standard where involved.

- In the retail, human services, and health care industries, oral literacy skills, listening and speaking, are the most needed or minimum foundation skills, followed by reading. The standards for the three service industries focus on communicating with clients and customers, eliciting verbal and written information from clients, and sharing information with clients that the worker has gathered from different sources.

- Written literacy skills seemed to be the most prevalent basic skill in the electronics industry standards. The standards focused on documenting and tracking a variety of different processes and developing plans and strategies

Table 4.

Number of Standards Involving Different SCANS Skills and Competencies and Most Prevalent SCANS Sub-Skills and Competencies Reflected in Each Industry's Skill Standards.

	SCANS Foundation Skills			SCANS Competencies				
Industry Skill Standards	Basic Skills	Thinking Skills	Personal Qualities	Resources	Interpersonal Skills	Information	Systems	Technology
Retail and Professional Sales (13 key tasks)	12 standards Speaking (11), combined with Listening (8) Arithmetic (6)	8 standards Reasoning (3) Creative Thinking (2)	11 standards Responsibility (6)	6 standards Allocates Materials and Facilities (5)	9 standards Serves Clients/Customers (5)	12 standards Acquires and Evaluates Information (9) Organizes and Maintains Information (7)	5 standards	5 standards
Community Support Service Worker (41 standards)	40 standards Listening and Speaking (38) Reading and Writing (33) Arithmetic (8)	31 standards Decision Making (19) Problem Solving (17) Combination of Decision Making and Problem Solving (13)	27 standards Sociability (15)	14 standards Allocates Time (11)	38 standards Serves Clients/Customers (25) Exercises Leadership (12) Participation as a Member of a Team (11) Teaches Others (9)	37 standards Separate Competency Area for Documentation	13 standards	2 standards

Table 4. (Continued)

Number of Standards Involving Different SCANS Skills and Competencies and Most Prevalent SCANS Sub-Skills and Competencies Reflected in Each Industry's Skill Standards (Continued).

	SCANS Foundation Skills			SCANS Competencies				
Industry Skill Standards	**Basic Skills**	**Thinking Skills**	**Personal Qualities**	**Resources**	**Interpersonal Skills**	**Information**	**Systems**	**Technology**
Health Care Services (8 core standards)	All standards Listening skills (8) Mathematics and Arithmetic (3)	All standards Combination of Reasoning, Problem-Solving, and/or Decision-making skills cluster (4)	7 standards Responsibility (4) Sociability (4)	4 standards	6 standards Works with Cultural Diversity (4) Participates as a Member of a Team (3)	6 standards Acquires and Evaluates Information (6)	5 standards Understands Systems (5)	3 standards Applies Technology to Task (3)
Electronics (59 key activities from 3 skill sets)	54 standards Combined Writing and Reading (52) Arithmetic (8)	41 standards Reasoning (30) Decision Making and Problem Solving (13)	45 standards Responsibility (25)	38 standards Allocates Time (30) All critical functions, primarily Resource Management and Planning strategies to Accomplish Work	33 standards Serves Client/Customer (24) Participates as a Member of a Team (12) All critical functions, primarily Communication	48 standards Acquires and Evaluates Information (35) Uses Computer to Process Information (5) All critical functions	22 standards Understands systems (19), combined with Monitoring and Evaluating Performance and Improving and Designing Systems (4) All critical functions, primarily Continuous Improvement	10 standards All critical functions, primarily Continuous Improvement

These findings are supported by the results of a broad-based study identifying critical behaviors in a variety of occupations. The National Job Analysis Study (1995) had workers identify and rank work-related behaviors across a broad representative sample of occupations. Five of the ten most important behaviors (Listening to the concerns of clients/customers and responding, Ability to use a computer to locate, process, or communicate information, Providing information to people, Judging the importance, quality, and accuracy of information, and Listening to instructions from or concerns of supervisors or co-workers and responding) directly relate to the SCANS competencies and foundation skills identified as common to the four industries.

Our findings also are supported by the Institute for Educational Leadership's report, *In Search of Commonalities* (1996), describing identification of commonalities among twenty-two diverse industry skill standard sets. Similarly to IEL's work, we culled common skills from standards sets including basic and occupational specific skills. The IEL study used the O*NET skills framework as a basis for sorting common skills across industry skill standards.

Cross Industry Categories

To create a workable set of cross-industry categories, given differences in foci among the four industries, we broke apart the very broad SCANS categories into areas of sub-skills that clustered together in relation to the standards of all four industries. We inductively generated eight categories that represent different areas of focus across the standards. These categories form a flexible framework, as we anticipate that some industries will focus more on some categories than on others. This will be important in designing and adapting assessment methods viable for different occupations and contexts.

The eight cross-industry competency areas are defined as follows:

- Client Orientation - Workers are sensitive to customer/client needs and adapt interactions, services, and products to best match these needs. New products, services, and markets are created as workers perceive the demand and innovate to best meet it. For example, electronics sales workers identify key decision makers in prospective companies, research company needs, and cross-check needs against service capabilities.
  (SCANS sub-skills: Serves Clients/Customers, Exercises Leadership, and Negotiates)

- Teamwork - Workers support coworkers and collaborate with workers from different fields or industries. For example, human service workers may facilitate services and collaborate with client's employer, school personnel, community service agencies, and health care agencies.
  (SCANS sub-skill: Participates as a Member of a Team)

- Evaluating and Interpreting Information - Workers assess contexts and clients/customers and use this information to assist with decision making and goal setting. Feedback on the quality of industry services is used to improve quality and maintain a competitive edge. For example, human service workers fully assess clients' physical, social, and mental well-being, as well as available supports, to assist in developing care and training plans to enhance client self-sufficiency.

(SCANS sub-skills: Acquires and Evaluates Information and Communicates and Interprets Information).

- Awareness of Safety and Security Practices - Workers understand human, legal, and civil rights involved in appropriate practice in their field and work to protect the interests of their clients/customers or the company/organization. For example, health care workers need to understand and use safe work practices to prevent infections and injury to themselves and patients.
  (SCANS sub-skills: Understanding Systems; SCANS thinking skills and personal qualities: Decision Making, Problem Solving, and Integrity/Honesty).

- Applying Technology (particularly computers) - Workers use technology across a variety of tasks both electronic and mechanical. For example, human service workers may need to be adept with a range of communication and adaptive equipment.
  (SCANS sub-skills: Uses Computers to Process Information, Selects Technology, and Applies Technology to Task).

- Organizing Information - Workers research, develop, and maintain databases or files of information about the customers/clients and about available services, products, and resources. For example, electronics manufacturing workers collect and maintain information on production set-ups and processes to ensure continuity and to improve performance.
  (SCANS sub-skills: Acquires and Evaluates Information and Organizes and Maintains Information).

- Managing Resources - Workers manage or assist clients with managing schedules, equipment, therapies or services, and materials. For example, retail workers may be responsible for taking inventory and reordering based on shopping patterns of their customers.
  (SCANS sub-skills: Allocates Time, Allocates Materials and Facility Resources).

- Professional Orientation - Workers establish connections to a larger professional context. They complete necessary training, engage in continued professional development, and educate clients/customers and the community about relevant issues. For example, health care workers are better prepared for employment when they are familiar with various career alternatives in the industry and the types of preparation required for them.
  (SCANS sub-skills: Understands Systems; SCANS personal qualities: Responsibility, Self-Esteem, and Self-Management).

These categories are certainly not comprehensive. Other common skill areas may exist among the industry standard sets and other standard sets may lead to the development of other or different categories. In addition, our cross-industry standards are not fully validated standards, having been reviewed only by project partners and staff.

Preliminary Assessment Development Efforts

We selected two performance-based assessment methods on which to focus our assessment development efforts: scenarios and portfolios. Scenarios and portfolios offer contrasting but complementary assessment methods that may be useful for large-scale or high-stakes assessment purposes. In general, performance-based assessments also allow for "stronger links among assessments, standards, and instructional/training goals" (Rabinowitz, 1996). They demand direct evidence of the ability to actually perform integrated, complex skills; they can be embedded in workplace contexts; and they often have high credibility. For the purposes of illuminating the connection between the cross-industry standards and assessment development, this paper will describe one type of assessment method focused on by the NSSAC project, written scenarios, and present example scenarios developed during NSSAC piloting efforts.

The written scenario involves presenting a work-related situation for which the respondent is asked to develop and present a solution. Scenarios challenge respondents to apply their workplace knowledge and use their critical thinking skills. Real world problems are often ill-defined and require workers to integrate different kinds of knowledge, then apply that knowledge in a new context. Students or workers must use critical thinking skills, such as organizing, summarizing, classifying, comparing, generalizing, and inferring, to construct effective solutions. Scenarios are on-demand assessments, administered under fairly standardized conditions during a short-time period (40-45 minutes). Additionally, scenario formats are already being used in industry for a variety of purposes. For instance, the Bioscience Standards by EDC used a scenario format for presenting their skill standards.

We began the assessment development process by asking each project partner to rank the eight cross-industry standards according to their 1) importance to the industry and 2) applicability for written scenario assessments. Scenario development then focused on the top-ranked cross-industry standards. Notably, *Client Orientation* and *Teamwork* were selected as the most relevant cross-industry standard categories and most amenable to scenario assessments. This is not surprising. At least one industry, retail, independently surveyed its constituents finding that nearly 90 percent of retail companies provide training for employees in customer service methods (Troppe, 1996).

Developing Scenario Prototypes

For assessments tasks that are embedded in the workplace and collected on an ongoing basis, one of the keys is to find ways to develop, monitor and assure the consistency and comparability of judgments across widespread sites or parts of the system (Wirt, 1993). One strategy that can be used to make assessments more comparable to each other involves using an assessment *prototype* or template to guide development.

A prototype or template serves the purpose of ensuring that an assessment task contains all of the necessary information presented in an identical way. For examinees, using such a template means they can gain familiarity with the process of responding to such a task and know what to do in a potentially stressful testing situation. For the assessment developer, the prototype provides a template for development and review of tasks. In these situations, valuable time and

template for development and review of tasks. In these situations, valuable time and resources are not lost reinventing the format; instead, time can be devoted to developing appropriate, specific content.

A prototype can be format guidelines or it can be more developed and linked to a specific kind of task, problem, or situation. One can adapt such a prototype to multiple industry contexts, situations and settings.

Using a scenario format piloted extensively with the Career-Technical Assessment Program (C-TAP) in the state of California, we adapted this template to create cross industry written scenarios. This template includes four scenario components: a title, prompt, instructions, and evaluation criteria. Our first example scenario shows these four components in relation to an actual cross-industry scenario.

As we worked with our industry partners to develop written scenarios, we focused on the generic types of work-related problem solving situations that evolved. This became an informal typology of work-related problem solving tasks that functioned across industry contexts. We identified five different prototypes of problem solving tasks which are described in the following section. Not all of these types of problems apply across every industry. Our five problem situations include:

- means-end scenarios,
- crisis and follow-up scenarios,
- roles and responsibilities scenarios,
- developing recommendations scenarios, and
- competing clients or priorities scenarios.

Each type of problem solving situation will be described in turn.

Means-End Scenarios

Means-end scenarios require the use of general problem solving strategies in a skill area related to a specific job. Respondents are given a hypothetical situation in which they are trying to reach some goal and need to find a means for getting there. Instructions for the scenario usually prime the respondent to use means-end analysis to develop a solution by breaking the end goal into sub goals that needed to be discussed in the answer as well. This type of scenario is broadly applicable. All NSSAC industry partners developed and piloted means-end scenarios.

Figure 4 presents an example means-end scenario. This scenario, Display Dilemma, is a retail scenario which addresses one module of the NRF Skill Standards, setting up and monitoring displays. Specifically, the module is used as the basis for assessing a sales associate's skills in tailoring displays to teenage customers. In writing a response, a respondent must draw on prior knowledge to design a display geared to teenagers, think of ways to judge the display's effectiveness and plan how different information gained through this process would be used to improve the display. Each of these steps is specified as a point to be addressed in the response.

Figure 4. Example of a Means-end Scenario

Title	***Display Dilemma*** *(A Client Orientation Scenario in Retail)*
Prompt	**Scenario** You are a sales associate in a large department store. Your store is having its annual weekend sale and you are expecting a large number of teenage customers. As you arrive for work you notice your department's sale was not constructed the previous night. Your supervisor asks you to spend the morning setting up the display.
Instructions	**Instructions** Think about what you know about presentation and displays. Describe in detail what you need to consider as you set up the display and explain your ideas. Also, describe several ways to monitor the effectiveness of the display during the sale. Discuss the information each monitoring activity would provide and what you could do to improve the display.
Evaluation Criteria	**To receive a Proficient rating on this task, you must show all of the following:** 1. Knowledge of: • monitoring effectiveness of displays • arranging merchandise to maximize sales 2. Ability to propose an effective solution to this scenario 3. Ability to communicate clearly in writing

At each step different issues may need to be considered. For example, a respondent might say that color, style, and placards or signs should be considered during display design. For the second step, monitoring effectiveness, customer behavior, that is, whether or not customers stop to look at the display, as well as daily sales totals could be checked. Finally, checking before and after sales for an item could inform designing future displays.

Crisis and Follow-up Scenarios

Crisis and follow-up scenarios present a critical situation typical in each industry that needs to be resolved immediately. Instructions in the scenario ask the respondent to tell how they would deal with the crisis and then what long-term strategies they would use to maintain good practice. For NSSAC, three out of the four participating industries developed and piloted this type of scenario; Electronics, Retail, and Health. We might expect that most companies have crisis situations arise that do involve long-term follow-up, therefore, this type of scenario is broadly applicable.

Our example of a crisis scenario is *A Change Order*, a teamwork scenario which was developed and piloted with the electronics industry. This scenario, shown in Figure 5 presents the respondent with the problem of receiving a manufacturing change on an important order on a short deadline. The situation involves solving this immediate problem, as well as telling what steps you would take to maintain positive team spirit and group cohesiveness. Instructions to this type of scenario ask the respondent to address both the short-term and long-term aspects of the problem in presenting a solution.

Figure 5. Example of a Crisis and Follow-up Scenario

Title	*A Change Order (A Teamwork Scenario in Electronics)*
Prompt	**Scenario** You are a team leader for a computer hardware manufacturing unit. You have just received a change order on a motherboard that your unit is fabricating. You know this motherboard is part of a large order for a customer and needs to be shipped overseas before 5:00 PM today.
Instructions	**Instructions** Think about what you know about initiating rapid change in the manufacturing process and building team support. Describe the steps you would take to identify the required changes and carry out the new specifications. Also, describe how you would maintain team spirit and cohesiveness during this process.
Evaluation Criteria	**To receive a Proficient rating on this task, you must show all of the following:** 1. Knowledge of: • change processes in manufacturing • leading work teams 2. Ability to propose an effective solution to this scenario 3. Ability to communicate clearly in writing

Roles and Responsibilities

This type of scenario focuses on situations in which respondents are requested to delineate the roles and responsibilities of different players in the workplace. The scenarios often involve knowledge of the scope of practice for specific jobs and how that relates to accomplishment of a larger task. Some may relate to line of authority situations, such as supervisor's responsibility for accurate work and task completion. These types of problem situations, although common, may not be universal among industries. For example only two NSSAC industries, Electronics and Health, developed and piloted roles and responsibilities scenarios.

The health care scenario, shown in Figure 6, *The Working Supervisor*, presents a situation in which the respondent's nursing supervisor is busy taking orders from a physician. Consequently, the supervisor has been unable to attend to patient care. When one of the supervisor's patients calls for immediate attention, the respondent must develop a solution that manages the situation, ensuring that proper procedures are followed and patient needs are met.

Figure 6. Example of a Roles and Responsibilities Scenario

Title	*The Working Supervisor (A Teamwork Scenario in Health Care)*
Prompt	**Scenario** You are a patient care technician. Your supervisor, a charge nurse, is assigned patients in addition to her other duties. This shift, she has spent a lot of time on the phone with a doctor dealing with necessary changes to patient's orders. While your supervisor is busy on the phone, one of her patients has turned on the call light. You observe that your supervisor is not responding to the patient's call light.
Instructions	**Instructions** Think about what you know about working as a member of a healthcare team and the roles and responsibilities of each team member. Given your scope of practice as a PCT, explain how you would ensure that appropriate patient care is given in this situation. Give examples of the kind of patient care you could administer on your own, could administer with approval, or could **not** administer (some one else would need to do) in this situation.
Evaluation Criteria	**To receive a Proficient rating on this task, you must show all of the following:** 1. Knowledge of: • scope of practice • teamwork skills 2. Ability to propose an effective solution to this scenario 3. Ability to communicate clearly in writing

In this situation, the respondent may be able to assist by providing some, but not all, of the same functions as the supervisor. The respondent must demonstrate knowledge of appropriate patient care and what they could or could not do, as well as how they might best contribute to the team effort. For instance, a respondent might say he or she would let the supervisor know they are answering the call light, make the patient comfortable without administering medication (citing specific activities to accomplish this) and/or find an individual who can administer medication or other therapies, as needed.

Developing Recommendations Scenarios

Developing recommendations scenarios present a situation in which the respondent is required to assess the extent or nature of a problem, draw on their knowledge of supports related to the problem and then compile a list of alternatives or options for the client customer to follow. In this type of scenario the options are different recommendations for actions or resources and the respondent is usually asked to provide a reason or justification for each option. Although only two NSSAC industries used this type of scenario, human services and retail, providing advice based on evaluation of a problem can be expected to be a universal and, thus, cross-industry type dilemma.

Our example of a recommendations scenario is *Supporting Participant Self-Advocacy*, a human services scenario (see Figure 7). This scenario involves a community support service worker who needs to help a client procure services for bathroom modification. Complications include prior classification of the housing unit and the client being a person with a disability. The

respondent must develop a solution that includes several recommendations for strategies the client can use to get assistance. In pilot testing, respondents suggested strategies such as getting a copy of the lease or rental agreement, contacting outside agencies, and/or moving to a new apartment.

Figure 7. Example of a Developing Recommendations Scenario

Title	*Supporting Participant Self-Advocacy (A Client Orientation Scenario in Human Services)*
Prompt	**Scenario** You work as a personal assistance practitioner providing support to people with disabilities who live independently. John, a new participant receiving support services, told you during an initial conversation that the bathroom facilities in his condominium were not suitably adapted to his needs. It was difficult for John to use the bathroom under these conditions. Because his housing arrangement had been classified as "accessible," John wanted to ask the condominium management for additional modifications.
Instructions	**Instructions** Think about what you know about supporting participants with disabilities in obtaining assistance from state, community, and health support agencies. Describe in detail what you should do and say so that John fully understands what options are available for getting assistance and what strategies he might use for obtaining aid to get his bathroom facilities appropriately adapted.
Evaluation Criteria	**To receive a Proficient rating on this task, you must show all of the following:** 1. Knowledge of: • self-advocacy methods and support groups • how to increase awareness of self-advocacy methods and groups • adapting interactions to best match participant needs 2. Ability to propose an effective solution to this scenario 3. Ability to communicate clearly in writing

Competing Clients or Priorities Scenarios

The competing clients or priorities scenario presents the equivalent of an in-basket task for line workers. Developing and presenting a solution involves juggling conflicting priorities along more than one dimension. The respondent has to prioritize competing tasks, keeping their clients in mind, and then explain how they would communicate their decision to the clients Two of the NSSAC industries developed and piloted these type of scenarios, health care and electronics. In contrast to the health care example shown above, the electronics scenario involved different types of services among internal versus external users.

The competing clients or priorities scenario in Figure 8, *Prioritizing Patients' Needs*, presents the situation of a health care technician who is responsible for several patients with different kinds of needs and different levels of criticality. Clinical or best practice considerations, as well as patient interaction considerations are involved. A newly arrived patient requires that specimens for lab tests be collected that will require personal attention for at least a half hour. Meanwhile, another patient is angry and demanding attention. The respondent must determine which patient and tasks need to be attended to first and then communicate their decision to their patients. Many respondents develop solutions that involve settling the angry patient down by

explaining why they were delayed, bringing him juice or a snack, and then explaining to him that another patient needs their attention. Respondents state that they plan to return, after collecting the required lab samples, to perform their regular duties and other types of patient care.

Figure 8. Example of a Competing Clients or Priorities Scenario

Title	*Prioritizing Patients' Needs (A Client Orientation Scenario in Health Care)*
Prompt	**Scenario** You are a patient care technician in a busy Intensive Care Unit (ICU) for an acute care facility. Today, you have four patients. This includes a new patients, just admitted to the unit. The new patient, Ms. Turrell, needs to have urine and blood specimens collected as soon as possible. Mr. Jones, another patient, has had his call light on for the last five minutes. So far you have been unable to answer it. Mr. Jones is now angrily yelling that he wants his dinner.
Instructions	**Instructions** Think about what you know about communication and patient care. Describe in detail what you should do so that patient care activities are prioritized in an appropriate manner. Explain what you would do or say to make sure Mr. Jones's needs are recognized.
Evaluation Criteria	**To receive a Proficient rating on this task, you must show all of the following:** 1. Knowledge of client interaction including: • providing personal care for patients • communicating effectively 2. Ability to propose an effective solution to this scenario 3. Ability to communicate clearly in writing

Using the Written Scenario Prototypes for Assessment Development

The problem situations represented in our five prototypes provide a range of cognitive complex tasks to challenge respondents to apply general as well as work-related knowledge and skills. The cross industry written scenario prototypes can be used as templates for constructing industry-specific contexts for such scenarios. Interestingly, development and implementation of the scenarios raised issues related to scope of practice and level of specificity levels. Skill standards reflect the needs of an entire industry, and each store, region, or sector of the industry has their own policies that might differ from the national skill standards or from store to store or area to area. How these issues played out in relation to scenario development is described below.

- *Scope of practice* - Industries — and positions within them — are structured quite differently. Industry skill standards reflect this difference. For instance, the retail skill standards are written for a specific job — professional sales associate — whereas the health core skill standards feature both core and occupational cluster standards. Although the health care scenarios were written to the core skill standards (e.g., teamwork), a specific job/position was used to contextualize the scenario prompt. Specifically, pilot-test health care scenarios placed the respondent in the role of a patient care technician, a newer multi-skilled worker designation. There is a trend in the industry in some regions to support and preferentially employ these types of workers. However, those pilot sites in areas where more traditional types of worker designations were the norm had to pre-assess the scenario tasks to decide if their program or training (e.g., Certified Nursing Assistant) related to the same level of performance expectations. For example, although a patient care technician

and a certified nursing assistant both perform overlapping tasks, this is not true of all tasks for which each type of worker is responsible.

Although scope of practice issues were most evident in the health care industry, they were evident in other industries as well. The retail scenarios posed some issues for respondents as well. Some respondents said they would not be called upon to establish displays or that their place of employment did not set up displays, such as the one posed in the scenario. So, even though the retail standards are written for a single position, there was still a scope of practice issue within the scenarios written to target this set of standards.

- *Level of generality vs. specificity* - Development efforts focused on providing specific situations yet making them generic enough to cut across the industry. This posed some concerns; some respondents mentioned they needed more information before responding (e.g., human services), while others commented that the topic (e.g., electronics) was too narrow. This is to be expected when developing for large industries. For example, in human services some community support service workers work with mentally retarded (MR) patients while others work in child welfare environments. Developing scenarios that were amenable across these different settings, yet provided enough detail for a realistic context was challenging.

  One possible strategy to address the generality vs. specificity tension is to allow respondents to tailor their scenario responses to the exact context within which they operate. For example, a Human Services scenario might describe a self-advocacy situation. The respondent might be instructed to select the type of patient he or she works with and then talk about appropriate steps to take in relation to this targeted population. The challenge here, of course, is developing scenarios that allow for these type of options yet still are comparable across employment situations.

Additionally, we found that project participants early on in the collaborative effort expressed their strong preference for couching assessment tasks in the context of their particular industry. The reasons given for this preference related to both content validity and face validity considerations. A major content validity consideration was that knowledge and skills are inextricably bound to context. For example, participants felt that although an emphasis on teamwork skills is common across industries, the specific teamwork skills differ across industries. Similarly, a face validity consideration is that in order for an assessment task to be credible with the stakeholders in a particular industry, that assessment tool must look like it is assessing skills specific to that industry. In fact, even within the same industry or occupational concentration it often proved difficult to develop scenarios that were considered by our content experts to have content and face validity for more than one specific occupational area.

Despite these issues, the NSSC project documented that there was widespread support among both educators and employers for written scenarios and for the idea of core cross-industry standard areas. Stakeholders recognize that written scenarios require respondents to apply occupationally-related knowledge to solve realistic problems. Both employers and educators like the written scenario because they represent a relatively cost-efficient means of measuring competency in relation to targeted standards. The scenario approach affords great flexibility; prompts and responses can be adapted to assessment modes other than written, such as video or oral assessments. By offering common processes and templates to stakeholders, we can help

"demystify" assessment for the field and help build recognition and support for skill standards and related assessment.

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